

West Boise Water Renewal Facility Virtual Tour



WHAT IS WATER RENEWAL?

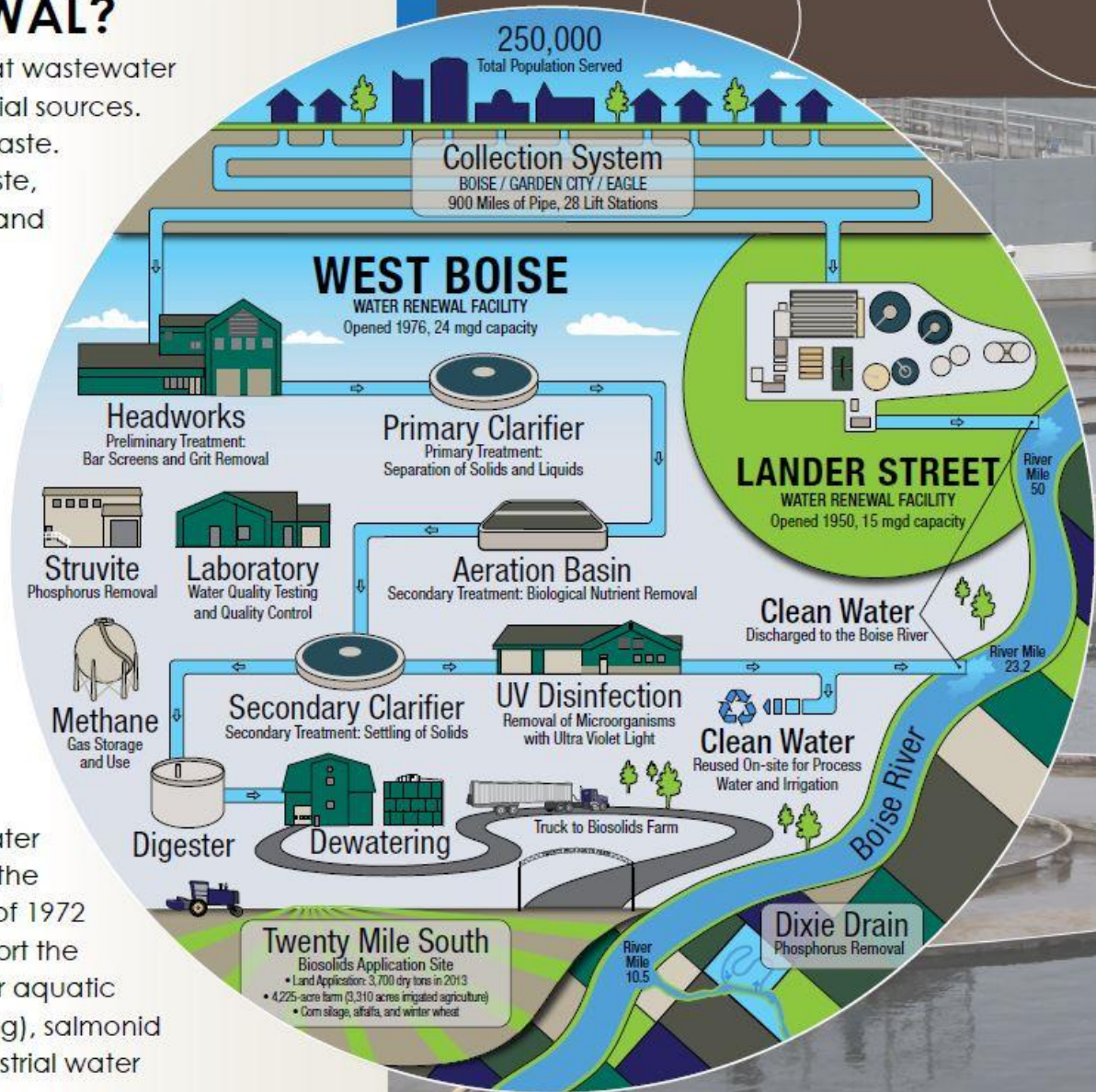
Water renewal is the process used to treat wastewater from residential, commercial, and industrial sources. Wastewater is 99.94% water and 0.06% waste. Some examples of waste are human waste, food, dirt, soap, personal care products and other chemicals.

WHY IS IT TREATED?

Clean water is essential for all living things. Water renewal facilities are necessary to protect environmental and human health. Waterborne diseases such as cholera and diphtheria are prevented. The treated water is returned to the Boise River to be used again and again downstream.

HOW IS IT REGULATED?

State and federal laws regulate wastewater treatment to protect human health and the environment since the Clean Water Act of 1972 was enacted. Renewed water must support the Boise River's beneficial uses of cold water aquatic life, primary contact recreation (swimming), salmonid spawning, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics.



Influent



- Influent is the used water coming into the facility
- Maximum capacity is 40 million gallons per day (mgd) at West Boise facility
- Average influent flow is 18 mgd
- What day of the year is our highest flow due to high water use?



Influent Flows Through Bar Screens to Remove Large Debris





Preliminary Treatment

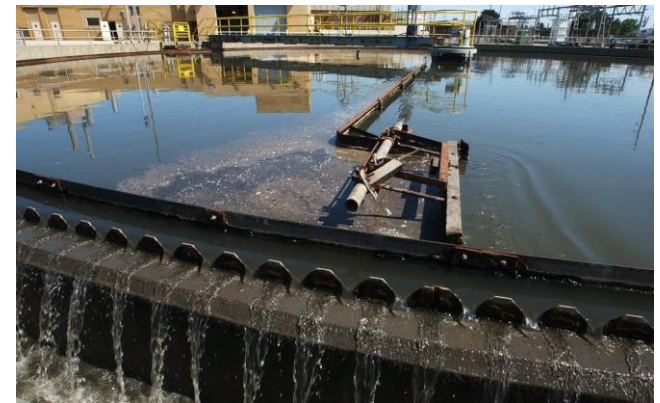
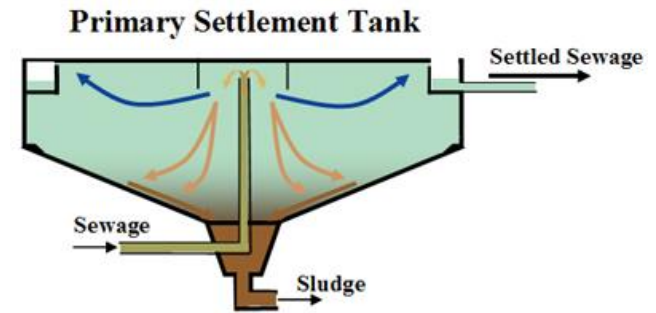
- Bar screens remove trash and coarse material mechanically
- Grit (sand, pebbles, coffee grounds, etc.) is removed using Archimedes screws
- All trash and grit is dumped into dumpsters and hauled to the landfill
- ~7,600 pounds of trash generated per week


Primary Clarifiers Settle Sludge To The Bottom And Float Scum To Surface For Removal



Primary Treatment

- Primary Clarifiers use gravity to settle out solids
- Rotating arms skim the floating scum (Fats, Oils, Greases) off the top of the water, to be concentrated and sent to the dumpsters
- Solid material that settles to bottom of basin, called sludge, is fermented then used as a food source for the microbes and finally delivered to the digesters

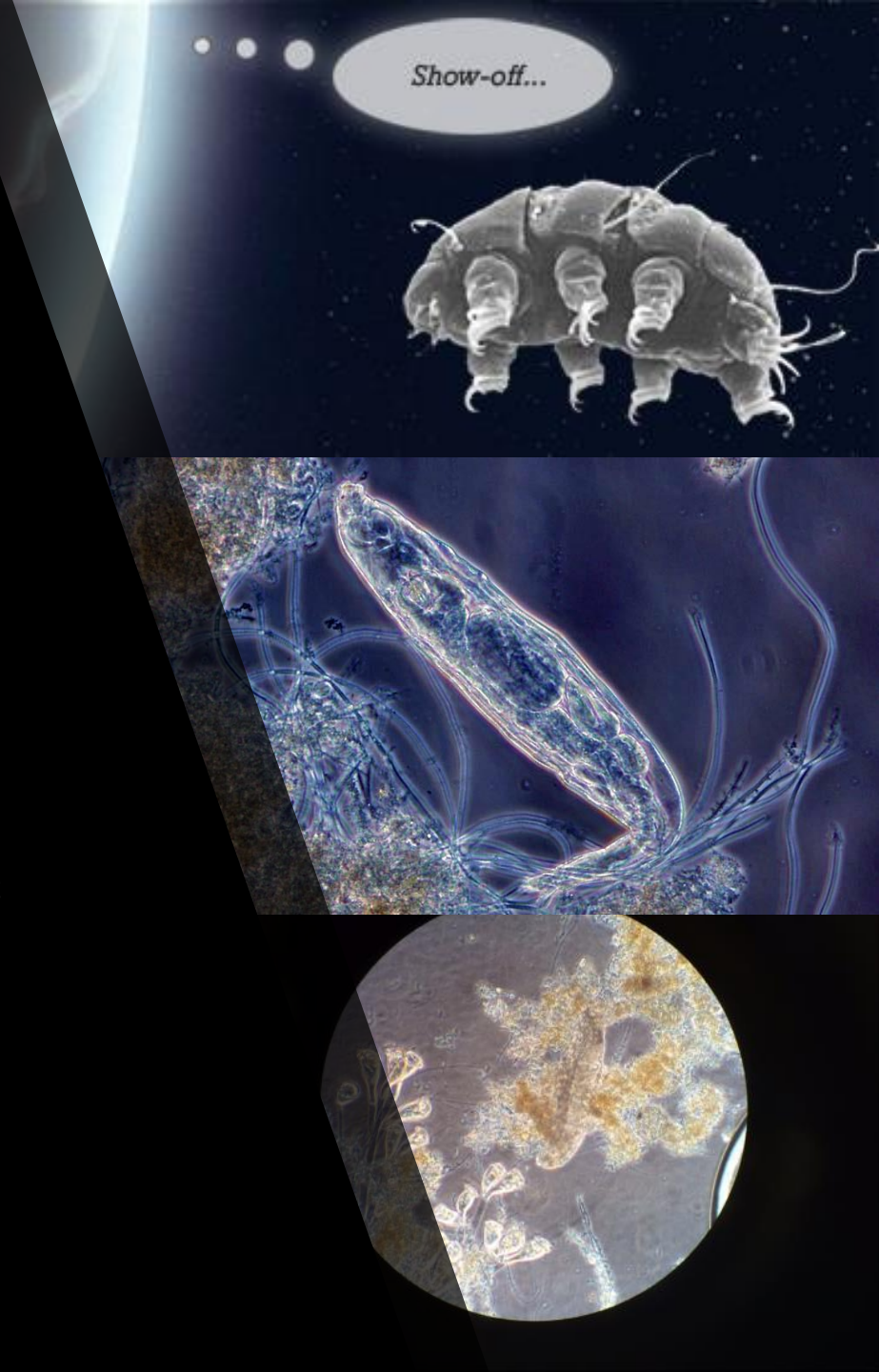


A photograph of a wastewater treatment plant's aeration basins. The foreground shows a large, dark, circular basin with a textured surface. In the background, there is a large, green, industrial building with a gabled roof. The sky is blue with some clouds, and mountains are visible in the distance. Several tall, black light poles are scattered around the facility.

Aeration Basins Are
Engineered For
Microorganisms to
Remove Nutrients

Secondary Treatment

- Aeration Basins use the Enhanced Biological Nutrient Removal (EBNR) process
- Microorganisms reduce concentration of organic suspended solid waste
- They break down nutrient contaminants such as Phosphorus and Nitrogen in the form of Ammonia
- A series of Anoxic, Anaerobic, and Aerobic zones control how much oxygen is available for the microbes
- Microorganism populations are optimized to consume maximum amount of waste





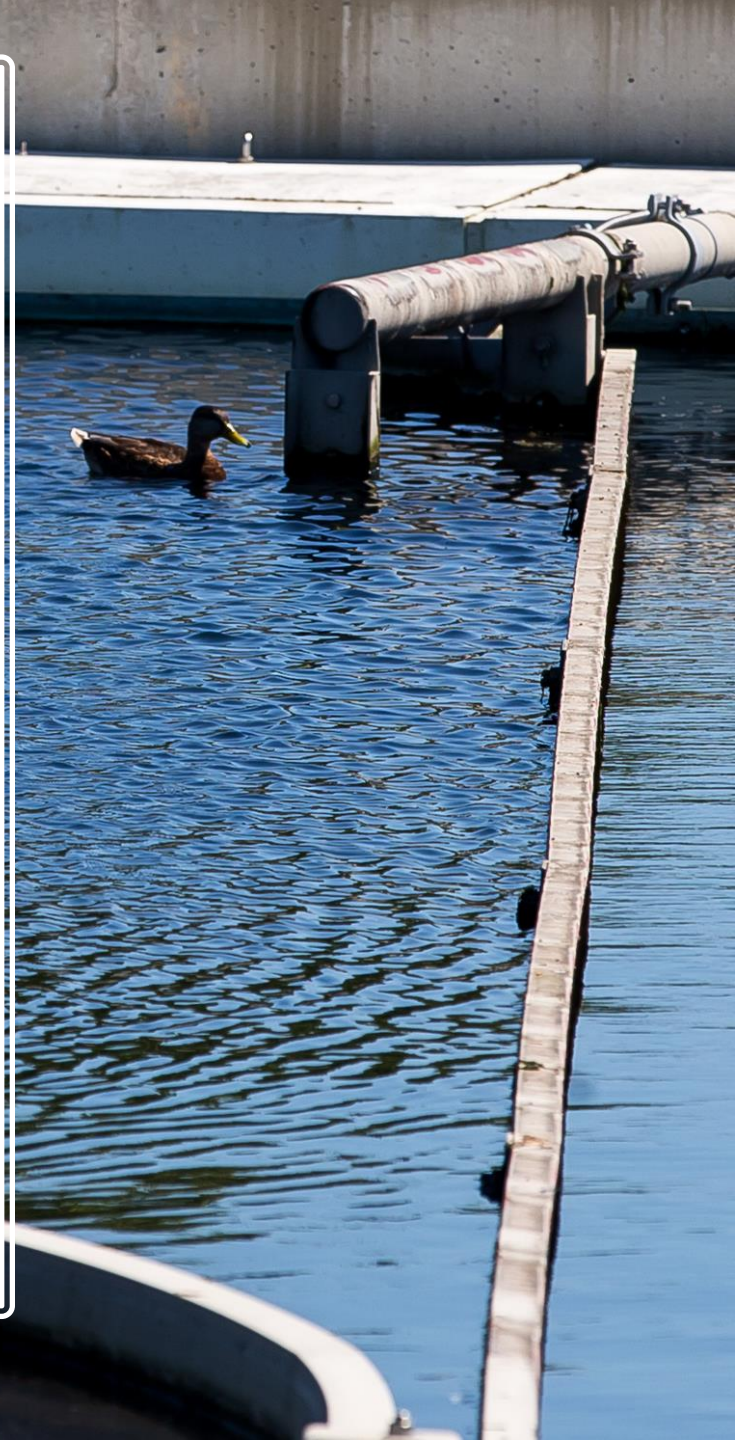
Why remove phosphorus
and nitrogen?



Secondary Clarifiers Further Settle Sludge And Microorganisms For Removal Or Reuse

Secondary Clarifiers

- Uses gravity to settle solid particles (mostly clumps of microorganisms called floc) out of the wastewater
- Many microorganisms are returned to the aeration basins.
- Some microbes are wasted, or sent to the digesters to be processed with the solids.





Ultraviolet Lights Kill
Harmful Microorganisms

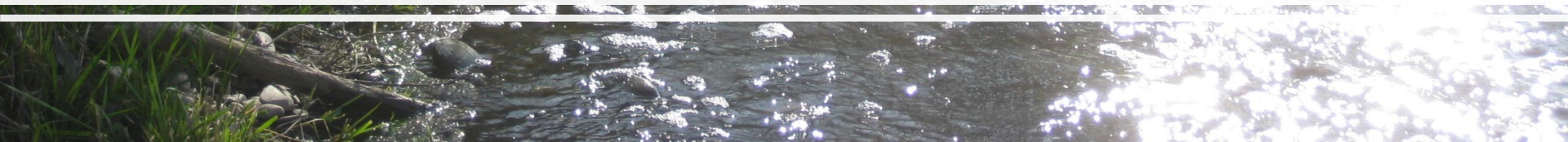


Ultraviolet Disinfection

- 2,500 Ultraviolet (UV) lights used to disinfect water coming from the secondary clarifiers
- UV disrupts the DNA of living organisms, which renders them sterile and unable to reproduce
- The treated water, called effluent, is discharged to the Boise River

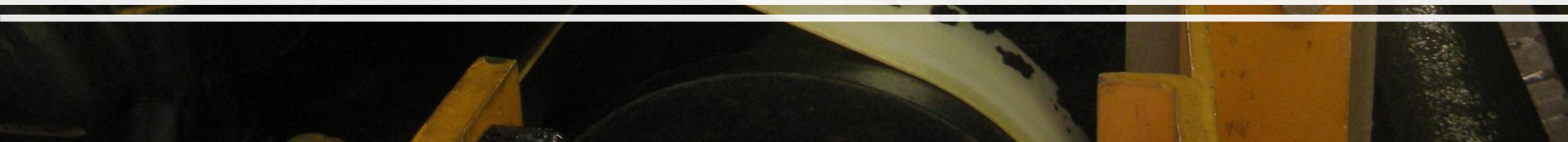


Effluent Discharged to Boise River





Solids Processing

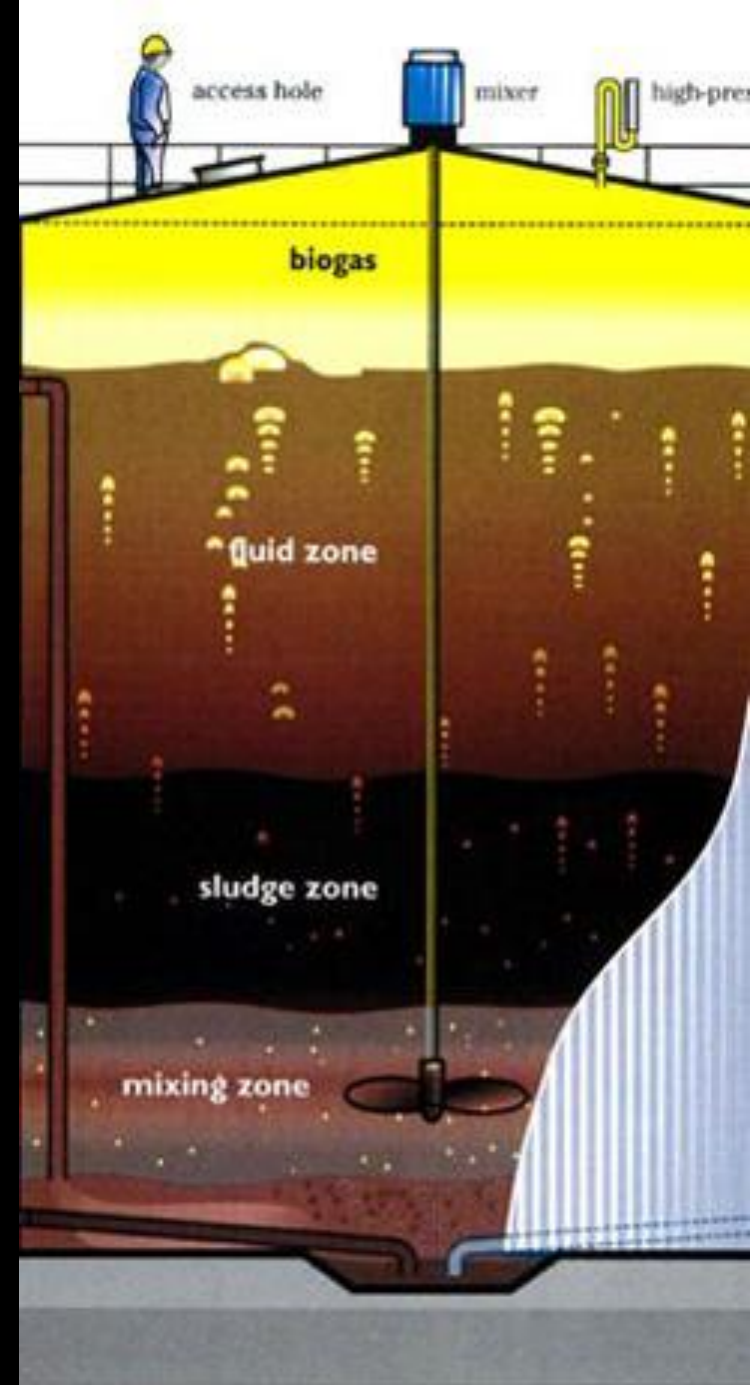




Anaerobic Digesters Heat Solids
And Activate Microorganisms
That Break Down Solids

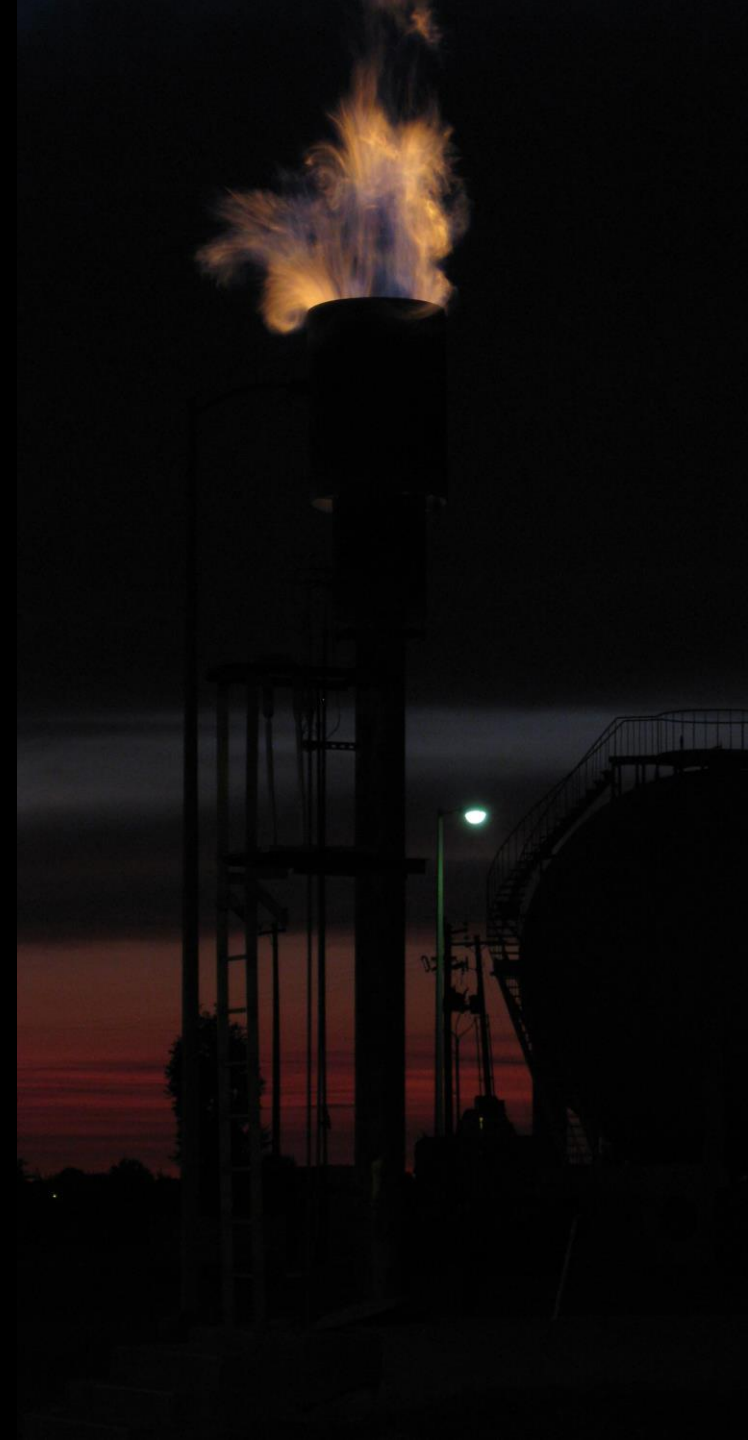
Digesters

- The solids removed from the primary and secondary clarifiers are digested
- Digesters heat solids to 98°F to activate microorganisms
- Solids spend an average of 28 days being digested



Methane Production

- Digestion of sludge produces Methane gas
- Methane gas is collected from the digester buildings and stored in a methane capture tank
- Some gas is used as fuel to heat the digesters
- The remaining Methane gas is burned and emitted into the atmosphere



Dewatering Biosolids

- Solids from digesters are 98% water, 2% solids
- Solids are run over a belt filter press and a polymer is added to thicken them
- Dewatered sludge, now called Biosolids, is about 85% water and 15% solids
- Biosolids are loaded into trucks and hauled to the City of Boise's farm



Farm = Biosolids Land Application

- Class B Biosolids are used as a fertilizer at the 4,300 acre city farm
- The farm's soil, water and crops are regulated by the EPA
- Crops such as corn, alfalfa, and winter wheat are grown using this fertilizer product to be sold locally to farmers



Struvite Production Facility

- Located at West Boise Water Renewal Facility
- Phosphorus recovered from waste stream
- Slow-releasing fertilizer
- Sold to commercial farmers



Dixie Drain Phosphorus Removal Facility near Snake River



- 49 acre site with two settling ponds
- Treats 130 mgd water from agricultural canal
- Removes 140 pounds of phosphorus per day
- Process similar to drinking water treatment